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IS 9975-1 (1981): Specification for 'O' Rings, Part I: Dimensions [MED 30: Gaskets and Packing]

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UDC 621-762·84 : 006·78 (Third Reprint AUGUST 1997) IS : 9975 (Part I) - 1981

Indian Standard

SPECIFICATION FOR 'O' RINGS

PART I DIMENSIONS

Gasket and Packings Sectional Committee, EDC 58; Oil Seal Subcommittee, EDC 58 : 3 [Ref. Doc : EDC 58 (3520)]

1. Scope — Covers the dimensions of 'O' rings for reciprocating and static purposes.

2. Applications — 'O' rings are normally suitable for static and slow reciprocating (up to a speed of 20 cm s) applications only.

2.1 For rotary applications, 'O' rings may be used where peripheral speeds are exceptionally low, but these are regarded as special cases requiring careful design parameters and are not covered in this standard.

3. Dimensions — The dimensions and tolerances for the metric series of 'O' rings, shown in Fig. 1, are listed in Table 1.

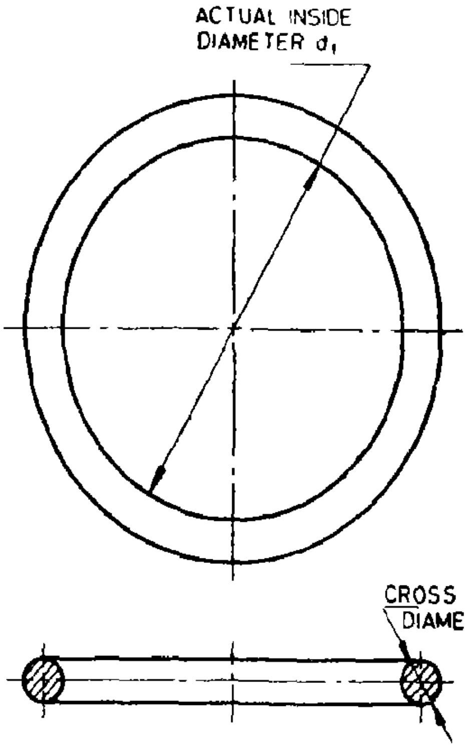

FIG. 1 'O' RING

3.1 'O' rings may be selected based on Table 1, but 'O' ring outside the dimensions listed therein, can also be had, where absolutely necessary. However, for new designs, it is recommended that 'O' rings are chosen from Table 1.

4. Tolerances — Table 1 lists the dimensions and tolerances applicable to the inside diameter and the selection of the various 'O' rings Methods of measurement shall be according to Appendix A.

5. Size Code Identification — In accordance with the International trends 'O' rings shall be *identified on the following basis:*

a) Use a size code consisting of eight digits,

b) Use the numbers of actual dimensions, but without decimal signs,

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NEW DELHI 110002

c) Use the first three digits to represent the section diameter (d_2) (Fig. 1) expressed in millimetres,

d) Use the next five digits to represent the inside diameter (d_1) (Fig. 1) expressed in millimetres, and

e) Assume decimal sign to be after the first and sixth digits.

Example:

Size Code	d_2	d_1
18000355	1·80	3·55
26503450	2·65	34·5
35505000	3·55	50·0
53023000	5·30	230·0
70046200	7·00	462·0

Note — Non-standard size may use the same format without confusing them with standard sizes

TABLE 1 INSIDE DIAMETERS, CROSS-SECTION AND TOLERANCES

(*Clauses* 3, 3.1, 4 and *Fig* 1)

All dimensions in millimetres.

d_1	*Tol* ±	d_2 *and Tol* ±				
		1·80 ± 0·03	2·65 ± 0·09	3·55 ± 0·10	5·30 ± 0·13	7·00 ± 0·15
1·80	0·13	×	—	—	—	—
2·00	0·13	×	—	—	—	—
2·24	0·13	×	—	—	—	—
2·50	0·13	×	—	—	—	—
2·80	0·14	×	—	—	—	—
3·15	0·14	×	—	—	—	—
3·55	0·14	×	—	—	—	—
4·00	0·14	×	—	—	—	—
4·50	0·14	×	—	—	—	—
5·00	0·15	×	—	—	—	—
5·30	0·15	×	—	—	—	—
5·60	0·15	×	—	—	—	—
6·00	0·15	×	—	—	—	—
6·30	0·15	×	—	—	—	—
6·70	0·16	×	—	—	—	—
7·10	0·16	×	—	—	—	—
7·50	0·16	×	—	—	—	—
8·00	0·16	×	—	—	—	—
8·50	0·16	×	—	—	—	—
9·00	0·17	×	—	—	—	—
9·50	0·17	×	—	—	—	—
10·0	0·17	×	—	—	—	—
10·6	0·18	×	—	—	—	—
11·2	0·18	×	—	—	—	—
11·8	0·19	×	—	—	—	—
12·5	0·19	×	—	—	—	—
13·2	0·19	×	—	—	—	—
14·0	0·19	×	×	—	—	—
15·0	0·20	×		—	—	—
16·0	0·20	×	×	—	—	—
17·0	0·21	×	×	—	—	—
18·0	0·21	—	×	×	—	—
19·0	0·22	—	×	×	—	—
20·0	0·22	—	×	×	—	—
21·2	0·23	—	×	×	—	—
22·4	0·24	—	×	×	—	—
23·6	0·24	—	×	×	—	—
25·0	0·25	—	×		—	—
26·5	0·26	—	×	×	—	—

(*Continued*)

AMENDMENT NO. 1 OCTOBER 1984
TO
IS:9975(Part I)-1981 SPECIFICATION FOR 'O' RINGS
Part I DIMENSIONS

Corrigendum

(Pages 2, 3 and 4, Table 1, col 3, subheading) - Substitute '1.80 ± 0.08' *for* '1.80 ± 0.03'.

(EDC 58)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 MARCH 1985

TO

IS:9975(Part 1)-1981 SPECIFICATION FOR 'O' RINGS

PART 1 DIMENSIONS

(*Page 4, Appendix A, clause A-2*) – Substitute the following for the existing clause:

'A-2 The inside diameter (d_1) shall be measured using a 'GO' and 'NO GO' tapered plug gauge or any similar method.'

(EDC 58)

Reprography Unit, BIS, New Delhi, India

TABLE 1 INSIDE DIAMETERS, CROSS-SECTION AND TOLERANCES — *Contd*

d_1	Tol ±	d_2 and Tol ±				
		1·80 ± 0·03	2·65 ± 0·09	3·55 ± 0·10	5·30 ± 0·13	7·00 ± 0·15
28·0	0·28	—		×	—	—
30·0	0·29	—			—	—
31·5	0·31	—		×	—	—
32·5	0·32			×	—	—
33·5	0·32	—	×	×	—	—
34·5	0·33	—	×		—	—
35·5	0·34	—		×	—	—
36·5	0·35	—	×		—	—
37·5	0·36	—		×	—	—
38·7	0·37	—	×		—	—
40·0	0·38		—		×	—
41·2	0·39	—	—		×	—
42·5	0·40	—	—	×	×	—
43·7	0·41	—	—	×	×	—
45·0	0·42	—	—		×	—
46·2	0·43	—	—		×	—
47·5	0·44	—	—		×	—
48·7	0·45	—	—		×	—
50·0	0·46	—	—		×	—
51·5	0·47	—	—		×	—
53·0	0·48	—	—		×	—
54·5	0·50	—		×	×	—
56·0	0·51	—	—	×	×	—
58·0	0·52	—		×	×	—
60·0	0·54	—	—		×	—
61·5	0·55				×	—
63·0	0·56	—	—		×	—
65·0	0·58		—		×	—
67·0	0·59					—
69·0	0·61	—	—	×	×	—
71·0	0·63	—	—	×	×	—
73·0	0·64	—		×	×	—
75·0	0·65			×	×	—
77·5	0·67	—	—	×	×	—
80·0	0·69	—	—	×	×	—
82·5	0·71				×	—
85·0	0·73	—	—	×	×	—
87·5	0·75	—	—	×	×	—
90·0	0·77	—	—		×	—
92·5	0·79		—		×	—
95·0	0·81		—	×	×	—
97·5	0·83	—	—	×	×	—
100	0·84		—	×	×	—
103	0·87	—	—	×	×	—
106	0·89	—		×	×	—
109	0·91				×	—
112	0·93		—	×	×	—
115	0·95		—	×	×	
118	0·97	—		×	×	—
122	1·00			×	×	—
125	1·03	—		×	×	—
128	1·05		—		×	—
132	1·08		—		×	—
136	1·10		—		×	—
140	1·13			×	×	—
145	1·17	—	—	×	×	—
150	1·20		—	×	×	—
155	1·24		—	×	×	—
160	1·27		—		×	—
165	1·31		—	×	×	—
170	1·34	—		×	×	—
175	1·38		—	×	×	—
180	1·41		—	×	×	—
185	1·44	—	—	×	×	—
190	1·48		—	×	×	—
195	1·51	—	—	×	×	—
200	1·55	—	—	×	×	—
206	1·59	—	—	—	×	×

(Continued)

TABLE 1 INSIDE DIAMETERS, CROSS-SECTION AND TOLERANCES — *Contd*

d_1	Tol ±	d_2 and Tol				
		1·80 ± 0·03	2·65 ± 0·09	3·55 ± 0·10	5·30 ± 0·13	7·00 – 0·15
212	1·63	—	—	—		
218	1·67	—	—	—	X	
224	1·71	—	—	—	X	X
230	1·75	—	—	—	X	X
236	1·79	—	—	—	X	
243	1·83	—	—	—	X	
250	1·88	—	—	—	X	
258	1·93	—	—	—	X	
265	1·98	—	—	—	X	
272	2·02	—	—	—	X	
280	2·08	—	—	—	X	
290	2·14	—	—	—	X	
300	2·21	—	—	—	X	
307	2·25	—	—	—	X	
315	2·30	—	—	—	X	X
325	2·37	—	—	—	X	X
335	2·43	—	—	—	X	
345	2·49	—	—	—	X	X
355	2·56	—	—	—		X
365	2·62	—	—	—	X	X
375	2·68	—	—	—	X	X
387	2·76	—	—	—	X	X
400	2·84	—	—	—	X	
412	2·91	—	—	—	—	X
425	2·99	—	—	—	—	X
437	3·07	—	—	—	—	
450	3·15	—	—	—	—	X
462	3·22	—	—	—	—	X
475	3·30	—	—	—	—	X
487	3·37	—	—	—	—	X
500	3·45	—	—	—	—	X
515	3·54	—	—	—	—	
530	3·63	—	—	—	—	X
545	3·72	—	—	—	—	X
560	3·81	—	—	—	—	X
580	3·93	—	—	—	—	X
600	4·05	—	—	—	—	X
615	4·13	—	—	—	—	
630	4·22	—	—	—	—	X
650	4·34	—	—	—	—	X
670	4·46	—	—	—	—	X

APPENDIX A

(*Clause* 4)

METHODS OF MEASUREMENT

A-1. Cross-section diameter 'd_2' shall be measured with a snap gauge or any other similar instrument which exerts a force of not more than 0·4 N on the rubber surface (or a pressure of 21 kN/m^2)

A-2. The inside diameter (d_1) shall be measured using a GO and NO GO plug gauge or any similar method.

EXPLANATORY NOTE

'O' rings form an essential sealing element in a wide range of application — a field which covers automobiles, pumps and general industry.

This standard is the first in the series related to 'O' rings.

The other standards of the series under preparation are:

Part II Material — their selection and quality acceptance criteria.

Part III Seal-housing, dimensions and tolerances and design criteria for standard applications.

Part IV Terminology and definition of terms.

Although this standard establishes the basis for standardization of 'O' rings, it should not be regarded as providing all the information for design purposes and therefore, close consultation should be maintained with the manufacturer to develop the 'O' ring for various applications.

Considerable assistance has been derived from the following sources in the preparation of this standard:

a) SAE J 120a (1968) 'Rubber rings for automotive applications', and

b) ISO/DIS 3601/I 'Inside diameters, cross-sections, tolerance and size identification code'.

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